



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/068,472	02/08/2002	Erik V. Johnson	120-294	8913
34845 7590 01/18/2008 McGUINNESS & MANARAS LLP 125 NAGOG PARK ACTON, MA 01720			EXAMINER LAVARIAS, ARNEL C	
			ART UNIT 2872	PAPER NUMBER
			NOTIFICATION DATE 01/18/2008	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

handerson@smmalaw.com
cmorrisette@smmalaw.com

Office Action Summary

Application No.

10/068,472

Applicant(s)

JOHNSON ET AL.

Examiner

Arnel C. Lavarias

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 November 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 7-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The declaration under 37 CFR 1.132 filed 11/19/07 is sufficient to overcome the rejection of Claims 1-6 based upon Brzozowski (J. of Lightwave Technology, vol. 19(1), January 2001).
2. Claims 1-6 are now rejected as follows.

Priority

3. Acknowledgment is made of applicant's claim for priority under 35 U.S.C. 119(e).

Drawings

4. The originally filed drawings were received on 2/8/02. These drawings are objected to for the following reason(s) as set forth below.

5. The drawings are objected to because of the following informalities:

Figures 44-46- Numbers and reference characters are not plain and legible. 37 CFR 1.84(p).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be

canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

6. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. *The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided.* The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

7. The abstract of the disclosure is objected to because of the following informalities:

Abstract, line 6- 'consists of' should read 'having' or 'including'.

Correction is required. See MPEP § 608.01(b).

8. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

9. Claims 1-2, 6 is objected to because of the following informalities:

Regarding Claim 1, the phrase "(absolute value)" in line 5 renders the claim problematic because it is not certain whether this limitation is to be part of the claimed invention. For purposes of examination, this limitation has been interpreted to be 'substantially equal in magnitude or absolute value'. Claim 2 is dependent on Claim 1, and hence inherits the deficiencies of Claim 1.

Claim 2, line 2- 'a second transmittance curve' should read 'a second reflectance curve' (See Pages 25-27; Figure 41 of the instant application).

Regarding Claim 6, the phrase "and/or" in line 2 renders the claim problematic because it is not certain which alternative is to be part of the claimed invention. See MPEP § 2173.05(d). For purposes of examination, this limitation has been interpreted to be 'or'. Appropriate correction is required.

Double Patenting

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not

identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claim 6, as best understood, is rejected on the ground of nonstatutory obviousness-

type double patenting as being unpatentable over Claim 1 of U.S. Patent No. 6636337.

Although the conflicting claims are not identical, they are not patentably distinct from each other because U.S. Patent No. 6636337 similarly claims an optical logic device (See Claim 1) for processing information optically using the transmitted or reflected characteristics of at least one stable, non-absorbing optical hard limiter (See Claim 1, lines 6-9, which recites an output which necessarily has been transmitted through the optical system).

Statute - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Statute - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim Rejections

14. Claims 1, 3-4, and 6, as best understood, are rejected under 35 U.S.C. 102(a) as being anticipated by Brzozowski et al. (L. Brzozowski, E. H. Sargent, 'Photonic crystals for integrated optical computing', Proc. SPIE, vol. 4089, June 18, 2000, pp. 786-796), of record.

Brzozowski et al. discloses an entirely passive all-optical device (See Page 788, Section II; Page 789, Section IIIa; Page 791, Section IIIc) comprising a stack (See Figure 1) of a plurality of alternating layers of a first medium and a second medium (See light and dark shaded layers in Figure 1), each medium characterized by a Kerr coefficient having one of a negative nonlinear coefficient and a positive nonlinear coefficient, each medium further characterized by a linear index of refraction, the Kerr coefficients of the first and second media being of opposite sign and substantially equal in magnitude or absolute value (See Pages 788-790, 791-793), the linear indices of refraction of the first and second media having substantially different magnitudes, the alternating layers

arranged such that the medium having the higher linear index of refraction has the negative nonlinear coefficient and the medium having the lower linear index of refraction has the positive nonlinear coefficient (See specifically Page 791, Section IIIc).

Brzozowski et al. additionally discloses the optical device providing a first transmittance curve substantially equal to an S-curve (See Figure 6).

Further Brzozowski et al. discloses an optical hard limiter (See Page 788, Section II; Page 789, Section IIIa; Page 791, Section IIIc) comprising an entirely passive all-optical device (See Figure 1) consisting of alternating layers of materials (See light and dark shaded layers in Figure 1) having oppositely signed Kerr coefficients and substantially different linear indices of refraction, wherein the higher linear index material has the negative Kerr coefficient and the lower linear index material has the positive Kerr coefficient (See Pages 788-790, 791-793). Brzozowski et al. additionally discloses transmitted characteristics of the optical hard limiter comprising a first range bounded by input signals in the range of approximately zero to I_1 in which the transmitted output signal of the stable, non-absorbing optical hard limiter is approximately zero; a second range bounded by input signals in the range approximately from I_1 to I_2 in which the transmitted output signal of the stable, non-absorbing optical hard limiter increases from zero to I_2 ; and a third range bounded by input signals in the range above approximately I_2 in which the transmitted output signal of the stable, non-absorbing optical hard limiter is approximately I_2 , where I_1 is approximately half of I_2 (See Figure 6, particularly for the case where $N=1000$, where N is the number of periods of alternating Kerr layers in Figure 1).

Finally, Brzozowski et al. discloses an optical logic device (See Page 788, Section II; Page 789, Section IIIa; Page 791, Section IIIc; Page 793, Section IIId) for processing information optically using the transmitted or reflected characteristics of at least one stable, non-absorbing optical hard limiter (See Figure 9; Pages 793-794).

15. Claims 2, 5, as best understood, are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Brzozowski et al.

Brzozowski et al. discloses the invention as set forth above in Claims 1, 3-4, and 6. Brzozowski et al. also inherently discloses the optical logic device wherein the reflected characteristics of the hard limiter comprise a first range, a second range, and a third range as recited in Claim 5 of the instant application, as well as the claimed N-curve for the reflectance curve as recited in Claim 2 (See Figures 6-7 of Brzozowski et al. for the transmitted characteristics of the optical hard limiter). Inherently, by the law of conservation of energy, the input intensity to the hard limiter must equal the sum of the energy absorbed, reflected, and transmitted by the hard limiter. Since the hard limiter is ideally a non-absorbing hard limiter, the input energy equals the sum of the output energy that is reflected and transmitted. Figure 6 of Brzozowski et al. discloses the transmitted energy as a function of the input energy. The reflected energy is therefore calculated as (input energy – transmitted energy), and this reflected energy is therefore plotted as a function of input energy as well, leading to the claimed characteristics and N-curve shape as recited in both Claims 2 and 5 of the instant application. In the case that Claims 2 and 5 are not clearly anticipated by Brzozowski et al., it would have been obvious to one skilled in the art at the time the invention was made to have the reflected characteristics

of the hard limiter include the claimed characteristics as recited in both Claims 2 and 5 of the instant application, since it has been held that discovering an optimum value of a result effective variable involved only routine skill in the art. One would have been motivated to have the reflected characteristics of the hard limiter include the claimed characteristics as recited in both Claims 2 and 5 of the instant application, for the purpose of adjusting the dynamic range of the hard limiter based on the refractive indices of the two materials used in the hard limiter. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). See also *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

16. Claim 6, as best understood, is rejected under 35 U.S.C. 102(b) as being anticipated by Smith (U.S. Patent No. 4507776).

Smith discloses an optical logic device for processing information optically using the transmitted or reflected characteristics of at least one stable, non-absorbing optical hard limiter (See Figures 1-5; col. 2, line 46-col. 5, line 24).

17. Claim 6, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Salehi et al. (J. A. Salehi, C. A. Brackett, "Code division multiple-access techniques in optical fiber networks- Part II: Systems performance analysis", IEEE Trans. Communications, vol. 37, no. 8, 8/1989, pp. 834-842.) in view of Kahn (L. M. Kahn, "Optical power limiting in multilayer systems with nonlinear response", Phys. Rev. B, vol. 53, no. 3, 1/15/1996, pp. 1429-1437.).

Salehi et al. discloses an optical logic device for processing information optically using the transmitted or reflected characteristics of at least one stable, optical hard limiter (See Section V; Figure 5). Salehi et al. lacks the optical hard limiter being non-absorbing

and comprising alternating layers of materials with different linear indices and oppositely signed Kerr coefficients. However, Kahn teaches a particular type of optical hard limiter that utilizes a periodic lattice of layers having alternating linear and nonlinear refractive indices for power limiting (See Figure 1; Sections I-III). The power limiting occurs through Kerr nonlinearity, as opposed to absorption (See Sections I and V), wherein the transmission of light through the material is dependent on the light intensity (See Page 1429, col. 2-Page 1430, col. 1; Equation 2.1) and that the positive (or zero) and negative coefficients show up in the coefficient 'g' (See Sections II and III; Figure 1). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the optical hard limiter be non-absorbing and comprise alternating layers of materials with different linear indices and oppositely signed Kerr coefficients, as taught by Kahn, in the device of Salehi et al., for the purpose of reducing the effects of defects and light absorption on the optical limiting process, as well as provide a passive means of optically limiting light without the use of additional electrical input.

Conclusion

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 571-272-2315. The examiner can normally be reached on M-F 9:30 AM - 6 PM EST.

Application/Control Number:
10/068,472
Art Unit: 2872

Page 11

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on 571-272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Arnel C. Lavarias
Primary Examiner
Group Art Unit 2872
1/14/08


ARNEL LAVARIAS
PRIMARY PATENT EXAMINER